ESA-083 Final Public Report, Boise Wallula

Introduction:

Boise Paper Solution's Wallula Mill is an integrated pulp and paper mill. The mill has over 400 employees and produces approximately 1,500 tons of paper per day.

The facility has five boilers, six pressure headers, several mechanical drive steam turbines, and three paper machines. The boilers include two Kraft recovery boilers (black liquor and supplemental natural gas), one hog fuel boiler (bark, chips, and supplemental natural gas), and two conventional, gas-fired power boilers. The rotary lime kiln burns both natural gas and reclaimed oil.

Objective of ESA:

The objective of the Boise Energy Savings Assessment (ESA) was to

- Perform an abbreviated Energy Savings Assessment using the Department of Energy's suite of Steam Tools, and
- Train the staff in the use of the Steam Tools so that they can identify additional energy savings opportunities after the Energy Savings Assessment.

Focus of Assessment:

Recovery, power, and hog fuel boilers; associated steam systems; process uses of steam

Approach for ESA:

Provided training on DOE Steam Tools suite and utilized same to identify and analyze potential energy savings opportunities.

- Identified opportunities and best practices using the Steam System Scoping Tool
- Modeled parts of the steam system using the Steam System Assessment Tool
- Used SSAT to estimate savings from opportunities identified in SSST
- Identified insulation-related opportunities using E3 PLUS

General Observations of Potential Opportunities:

In 2005 the Wallula Mill consumed 1,940,019 MMBtu of natural gas and 444,917 MWh of electric energy. The impact fuel and electricity costs for this energy savings assessment were $8.57/MMBtu and $0.03899/kWh, respectively.

Energy Source	2005 Consumption (MMBtu)	Current Unit Cost ($/MMBtu)	Estimated Total Cost ($)
Natural gas	1,940,019	8.57	16,625,966
Electricity	1,518,501	11.42	17,347,304
Hog fuel	1,734,480	2.50	4,336,199
Reclaimed oil	171,424	6.50	1,114,255
Total	5,364,424		39,423,723

The potential energy savings opportunities are summarized on page one. The summary includes estimated time horizons for implementation of the opportunities. The opportunities are categorized as near-term, medium-term, or long-term according to the general guidelines below.

- **Near-term opportunities** include actions that can easily be attained in less than one year. Examples include improvements in operating activities, equipment maintenance, and relatively low cost actions or purchases.

- **Medium-term opportunities** would typically require one to two years to implement and would require additional engineering and economic analysis. Examples include capital equipment purchases and moderate changes to the plant's steam system or processes.
- **Long-term opportunities** typically require two to five years to implement. Examples include new technologies or significant changes to either the steam system or the plant's processes.

The potential savings opportunities can be categorized as near-, medium-, and long-term opportunities as shown in the table below:

Time Horizon	% of Savings Opportunities
Near-term	67%
Medium-term	33%
Long-term	0%

The savings opportunity calculations are contained in Excel spreadsheet files:

File	Contents
ESA-083 Boise Wallula SSST	Steam System Scoping Tool results
ESA-083 Boise Wallula SSAT 3 Header	Used to demonstrate SSAT capabilities
ESA-083 Boise Wallula SSAT 2 Header 460-340	Used for PRV vs. backpressure turbine analysis
ESA-083 Boise Wallula SSAT 2 Header 340-250	Used for PRV vs. backpressure turbine analysis
ESA-083 Boise Wallula SSAT 1 Header	Used to estimate trap, leak, and insulation opportunities
ESA-083 Boise Wallula Data	Summaries of steam header data, insulation savings, energy use, and energy savings

Management Support and Comments:

The Wallula Mill is actively pursuing energy savings opportunities. The mill has a full-time energy engineer and a cross-functional energy savings team. The annual employee bonus program includes a component based on energy savings. The team will use the DOE Steam Tools to identify additional opportunities to reduce their $39 million annual energy bill.

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